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A Sampling of Argonne's Expertise . . .

Argonne has four major mission areas, each of which fulfills important governmental and Department of Energy responsibilities, as well as provides important benefits to our society. Those mission areas are conducting basic scientific research, operating national scientific facilities, enhancing the Nation's energy resources, and developing better ways to manage environmental problems.

Argonne is a large, multi-program R&D laboratory, and is adept and experienced at assembling multi-disciplinary teams of experts to solve challenging scientific and technological problems.

- Advanced Batteries
- Advanced Computing
- Analytical Instrumentation
- Biomedical Applications
- Biotechnology
- Chemical Engineering
- Chemistry
- Corrosion and Fouling
- Decontamination and Decommissioning
- Electrochemical Energy Systems
- Electronics Engineering
- Energy Conversion and Storage
- Engineered Materials and Coatings
- Engineering Mechanics
- Environmental Assessment and Stewardship
- Environmental Compliance/Restoration
- Fluid Dynamics and Multiphase Flow
- Fossil Energy Systems
- Friction, Wear, and Lubrication
- Fuel Cells
- Hazardous Waste Management
- Heat Transfer
- Materials Science
- Modeling and Simulation
- Nondestructive Evaluation
- Nuclear Energy Systems
- Nuclear Magnetic Resonance Imaging
- Residual Stress Measurements
- Sensors and Instrumentation
- Separations Science
- Superconductivity
- Synchrotron X-Ray Applications
- Thermal Energy Storage
- Transportation Technology
- Tribology

Hydrogen-Powered Fuel Cells for a Cleaner, More Secure Energy Future

Conference of G8 Energy Ministers

Detroit, Michigan, U.S.A.
May 1–3, 2002

Office of Science
U.S. Department of Energy

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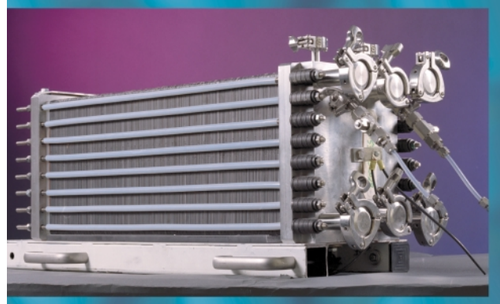
Argonne National Laboratory

Hydrogen-Powered Fuel Cells for a Cleaner, More Secure Energy Future

Emission-Free, Petroleum-Free Energy



The Department of Energy's Office of Advanced Automotive Technologies established the Fuel Cell Test Facility at Argonne to provide independent, standardized testing and evaluation for developers of fuel cells.

Fuel cells powered by hydrogen produce clean, emission-free energy, but hydrogen is not yet available to consumers. And although hydrogen burns cleanly, current processes for making it can have the same harmful environmental effects (such as "greenhouse gases") as the use of fossil fuels.

"America must have an energy policy that plans for the future, but meets the needs of today. I believe we can develop our natural resources and protect our environment."

– President George W. Bush

How Will Hydrogen Be Provided?

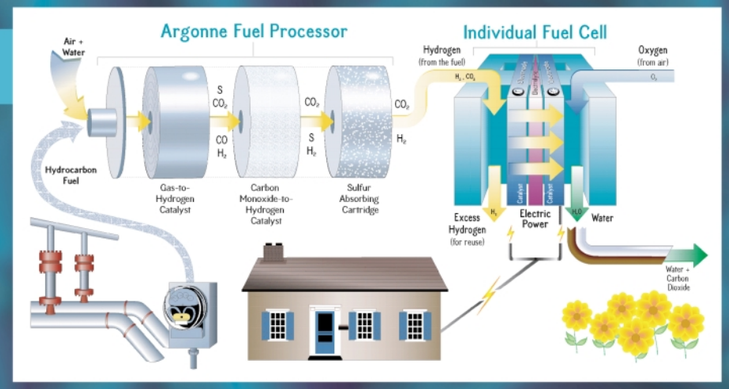
Near Term: Argonne National Laboratory's fuel processor (at right) could serve as a transition technology until hydrogen is readily available, allowing the use of fuel cells for transportation and residential electric power.

Mid Term: Hydrogen can be made locally from water, without greenhouse gases, using electricity distributed on the electrical grid from nuclear power plants.

Long Term: Hydrogen can be produced from water at a central plant using more efficient chemical processes and nuclear energy, and could be distributed by pipeline.

Generating Hydrogen for Fuel Cells in Vehicles and Homes

Secretary of Energy Spencer Abraham views an Argonne invention that could meet the near-term need for hydrogen. The compact, efficient device "processes" commonly available fuels to produce hydrogen to power fuel cells, with near-zero pollutant emissions. The R&D 100 award-winning catalyst that is key to this technology has been licensed by Süd-Chemie, Inc., and the processor design (diagram at right) is the basis for a hydrogen-powered residential fuel cell that is now entering the market. A processor this size could provide hydrogen for a fuel cell power system that would meet the electrical and hot water needs of a typical four-person household.



"The President's Plan directs us to explore the possibility of a hydrogen economy."

– Spencer Abraham, Secretary of Energy

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Office of Science U.S. Department of Energy

Argonne is one of the U.S. government's oldest and largest science and engineering research laboratories – the largest in the Midwest. For the past half-century, the University of Chicago has overseen operation of Argonne for the United States Department of Energy and its predecessor agencies.

Helping the Nation to develop cleaner, more secure energy is among the Laboratory's highest priorities. Argonne conducts extensive research and development on advanced fuel cell systems for transportation and portable and stationary power sources. Our state-of-the-art Fuel Cell Test Facility is available to fuel cell developers to provide independent, standardized testing and evaluation of all types of fuel cell systems. Argonne's highly multi-disciplinary nature makes it an ideal laboratory for research and development toward the widespread use of hydrogen as a fuel.

Argonne has been at the forefront of nuclear energy research since its earliest days, and is unparalleled in its scientific and engineering achievements in nuclear research and development. We are world leaders in all aspects of the nuclear materials fuel cycle, and have been the key contributor to the commercial nuclear power plant technology resident in the United States today.

Argonne has a long tradition of working with public- and private-sector organizations around the globe. We invite you to visit our web site to learn more about our research and development on hydrogen and fuel cells, and our many other research programs that are contributing to our Nation's energy future.

www.anl.gov/G8 (630-252-5562)